WHAT IS CLAIMED IS:

1. An image forming apparatus, comprising:

a data buffer unit that buffers input binary data, the sub-scan resolution of which is 2/n (n: an odd integer greater than or equal to 3) times a sub-scan print resolution;

a data transform unit that transforms the input binary data into output multi-level data of the sub-scan print resolution; and

a light beam modulation unit that modulates radiant energy of a light beam in accordance with the output multi-level data.

2. The image forming apparatus as claimed in claim 1, wherein

said light beam modulation unit forms a dot, the barycenter of which lies on a scan line corresponding to the sub-scan input resolution of the

binary image data, by superposing light beams lying on adjacent (n+1)/2 scan lines corresponding to the sub-scan print resolution.

3. The image forming apparatus as claimed in claim 2, wherein

said light beam modulation unit adjusts the radiant energy of the light beam lying on one of the adjacent (n+1)/2 scan lines on one end, to substantially 1/2 times the radiant energy of the light beams lying on other scan lines.

4. The image forming apparatus as claimed in claim 1, wherein

said light beam modulation unit forms 2 dots, each having the barycenter lying on one of 2 scan lines corresponding to the sub-scan resolution of the binary image data, by selectively superposing light beams on "n" adjacent scan lines separated at a

distance corresponding to the sub-scan print resolution.

5. The image forming apparatus as claimed in claim 1, wherein

said data transform unit transforms the input binary image data of 2 input scan lines into the output multi-level data of "n" output scan lines.

6. The image forming apparatus as claimed in claim 5, wherein

said data transform unit comprises a data transform table that relates the input binary image data of 2 input scan lines to the output multi-level data of "n" output scan lines.

7. The image forming apparatus as claimed in claim 5, wherein

said data transform unit sets the output multi-level data of upper (n-1)/2 output scan lines equal to the input binary data of an upper input scan line, the output multi-level data of lower (n-1)/2 output scan lines equal to the input binary data of a lower input scan line, and the output multi-level data of a middle output scan line is based on the input binary data of the upper input scan line and the input binary data of the lower input scan line.

8. The image forming apparatus as claimed in claim 1, wherein

said data buffer unit buffers input binary data, the sub-scan resolution and the main-scan resolution of which are 2/n (n: an odd integer greater than or equal to 3) times the sub-scan print resolution and a main-scan print resolution, respectively; and

said data transform unit transforms the input binary data into output multi-level data of the

sub-scan print resolution and a main-scan print resolution.

9. The image forming apparatus as claimed in claim 8, wherein

said data transform unit transforms the input binary image data of a 2x2 matrix corresponding to 2 pixels in the main scan directions and 2 input scan lines into the output multi-level data of a "n" x "n" matrix corresponding to "n" pixels in the main scan directions and "n" output scan lines.

10. The image forming apparatus as claimed in claim 9, wherein

said data transform unit comprises a data transform table that relates the input binary data of a 2x2 matrix corresponding to 2 pixels in the main scan directions and 2 input scan lines into the output multi-level data of the "n" x "n" matrix

corresponding to "n" pixels in the main scan directions and "n" output scan lines.

11. The image forming apparatus as claimed in claim 9, wherein

said data transform unit divides the "n" x "n" matrix with the middle pixel array and the middle scan line into four "(n-1)/2" x "(n-1)/2" sub-matrixes, and

determines the output multi-level data of the four "(n-1)/2" x "(n-1)/2" sub-matrixes based on the corresponding respective input binary data;

the output multi-level data of the upper "(n-1)/2" items and the output multi-level data of the lower "(n-1)/2" items in the middle pixel array are based on 2 upper items and 2 lower items, respectively, in the 2x2 matrix;

the output multi-level data of the left "(n-1)/2" items and the output multi-level data of the right "(n-1)/2" items in the middle scan line are based on 2 left items and 2 right items, respectively, in the 2x2 matrix; and

the output multi-level data of the cross point of the middle pixel array and the middle scan line are based on 4 items in the 2x2 matrix.

12. The image forming apparatus as claimed in claim 11, wherein the data transform unit, when determining the output multi-level data of the middle pixel array based on the 2x2 matrix,

shifts the phase of the output multi-level data so that a pulse of the light beam is shifted in the main scan directions toward a pixel that is turned on.

13. An image forming apparatus, comprising:

a data buffer unit that buffers input binary data, the sub-scan resolution of which is 2/n (n: an odd integer equal to or greater than 3) times a sub-scan print resolution;

a data transform unit that transforms the

input binary data into output multi-level data of the sub-scan print resolution;

a plurality of light sources that radiates light beams for scanning a photosensitive unit; and

a plurality of light beam modulation units each of which modulates radiant energy of the light beam radiated by one of said light sources.

14. The image forming apparatus as claimed in claim 1, further comprising:

a light source that radiates a light beam; and

a deflection unit that deflects the light beam radiated by said light source;

wherein

the image forming apparatus forms an image by a raster scanning method.

15. The image forming apparatus as claimed

in claim 8, further comprising:

a solid-state scanning unit in which a plurality of light sources is arranged in the main scan directions for forming an image by a solid-state scanning method.

16. The image forming apparatus as claimed in claim 14, wherein

said light beam modulation unit modulates one of the pulse width of the light beam, the intensity of the light beam, and both.

17. An image forming apparatus, comprising:

means for buffering input binary data, the sub-scan resolution of which is 2/n (n: an odd integer equal to or greater than 3) times a sub-scan print resolution;

means for transforming the input binary data into output multi-level data of the sub-scan

print resolution; and

means for modulating radiant energy of a light beam in accordance with the output multi-level data.

18. The image forming apparatus as claimed in claim 17, wherein

said means for modulating the radiant energy of the light beam forms a dot, the barycenter of which lies on a scan line corresponding to the sub-scan input resolution of the binary image data, by superposing light beams lying on adjacent (n+1)/2 scan lines corresponding to the sub-scan print resolution.

19. The image forming apparatus as claimed in claim 18, wherein

said means for modulating the radiant energy of the light beam adjusts the radiant energy

of the light beam lying on one of the adjacent (n+1)/2 scan lines on one end, to substantially 1/2 times the radiant energy of the light beams lying on other scan lines.

20. The image forming apparatus as claimed in claim 17, wherein

said means for modulating the radiant energy of the light beam forms 2 dots, each having the barycenter lying on one of 2 scan lines corresponding to the sub-scan resolution of the binary image data, by selectively superposing light beams on "n" adjacent scan lines separated at a distance corresponding to the sub-scan print resolution.

21. A method of forming an image for an image forming apparatus, comprising the steps of:

buffering input binary data, the sub-scan

resolution of which is 2/n (n: an odd integer equal to or greater than 3) times a sub-scan print resolution;

transforming the input binary data into output multi-level data of the sub-scan print resolution;

modulating radiant energy of a light beam in accordance with the output multi-level data; and

superposing the light beam on a scan line with the light beam on a adjacent scan line thereby to form a composite light beam, the barycenter thereof being on a scan line of 2/n times the sub-scan print resolution.

22. The method as claimed in claim 21, wherein the input binary data of 2 scan lines are transformed into the output multi-level data of "n" scan lines.

23. The image forming apparatus as claimed in claim 22, wherein the input binary data are transformed into the output multi-level data of the sub-scan print resolution with a data transform table.

24. The method as claimed in claim 22, wherein, in the step of transforming the input binary data, the output multi-level data of upper (n-1)/2 output scan lines are set equal to the input binary data of an upper input scan line, the output multi-level data of lower (n-1)/2 output scan lines are set equal to the input binary data of a lower input scan line, and the output multi-level data of a middle output scan line are based on the input binary data of the upper input scan line and the input binary data of the lower input scan line.

25. The method as claimed in claim 21, wherein,

in the step of buffering the input binary data, the input binary data, the sub-scan resolution and the main-scan resolution of which are 2/n (n: an odd integer equal to or greater than 3) times the sub-scan print resolution and a main-scan print resolution, respectively, are buffered; and

in the step of transforming the input binary data, the input binary data are transformed into the output multi-level data of the sub-scan print resolution and a main-scan print resolution.

26. The method as claimed in claim 25, wherein

in the step of transforming the input binary data, the input binary image data of a 2x2 matrix corresponding to 2 pixels in the main scan directions and 2 input scan lines are transformed into the output multi-level data of a "n" x "n" matrix corresponding to "n" pixels in the main scan directions and "n" output scan lines.

27. The method as claimed in claim 26, wherein

in the step of transforming the input binary data, a data transform table is used that relates the input binary data of the 2x2 matrix corresponding to 2 pixels in the main scan directions and 2 input scan lines to the output multi-level data of the "n" x "n" matrix corresponding to "n" pixels in the main scan directions and "n" output scan lines.

28. The method as claimed in claim 26, wherein, in the step of transforming the input binary data:

the "n" x "n" matrix with the middle pixel array and the middle scan line is divided into four "(n-1)/2" x "(n-1)/2" sub-matrixes;

the output multi-level data of the four "(n-1)/2" x "(n-1)/2" sub-matrixes are determined based on the corresponding respective input binary data;

the output multi-level data of the upper "(n-1)/2" items and the output multi-level data of

the lower "(n-1)/2" items in the middle pixel array are determined based on 2 upper items and 2 lower items, respectively, in the 2x2 matrix;

the output multi-level data of the left "(n-1)/2" items and the output multi-level data of the right "(n-1)/2" items in the middle scan line are determined based on 2 left items and 2 right items, respectively, in the 2x2 matrix; and

the output multi-level data of the cross point of the middle pixel array and the middle scan line are determined based on 4 items in the 2x2 matrix.

29. The method as claimed in claim 28,

wherein, in the step of transforming the input binary data, when the output multi-level data of the middle pixel array based on the 2x2 matrix are determined,

the phase of the output multi-level data is shifted so that a pulse of the light beam is shifted in the main scan directions toward a pixel that is turned on.

30. An image resolution conversion circuit for an image forming apparatus, comprising:

a data buffer unit that buffers input binary data, the sub-scan resolution of which is 2/n (n: an odd integer equal to or greater than 3) times a sub-scan print resolution;

a data transform unit that transforms the input binary data into output multi-level data of the sub-scan print resolution; and

a light beam modulation unit that modulates radiant energy of a light beam in accordance with the output multi-level data.

31. The image resolution conversion circuit as claimed in claim 30, wherein

said data transform unit transforms the input binary image data of 2 input scan lines into the output multi-level data of "n" output scan lines.

32. The image resolution conversion circuit as claimed in claim 31, wherein

said data transform unit comprises a data transform table that relates the input binary image data of 2 input scan lines to the output multi-level data of "n" output scan lines.

33. The image resolution conversion circuit as claimed in claim 32, wherein

said data transform unit sets the output multi-level data of upper (n-1)/2 output scan lines equal to the input binary data of an upper input scan line, the output multi-level data of lower (n-1)/2 output scan lines equal to the input binary data of a lower input scan line, and the output multi-level data of a middle output scan line are based on the input binary data of the upper input scan line and the input binary data of the lower input scan line.

34. The image resolution conversion circuit as claimed in claim 30, wherein

said data buffer unit buffers input binary data, the sub-scan resolution and the main-scan resolution of which are 2/n (n: an odd integer equal to or greater than 3) times the sub-scan print resolution and a main-scan print resolution, respectively; and

said data transform unit transforms the input binary data into output multi-level data of the sub-scan print resolution and a main-scan print resolution.

35. The image resolution conversion circuit as claimed in claim 34, wherein

said data transform unit transforms the input binary image data of a 2x2 matrix corresponding to 2 pixels in the main scan directions and 2 input scan lines into the output multi-level data of "n" x "n" matrix corresponding to "n" pixels in the main scan directions and "n" output scan lines.

36. The image resolution conversion circuit as claimed in claim 35, wherein

said data transform unit comprises a data transform table that relates the input binary data of a 2x2 matrix corresponding to 2 pixels in the main scan directions and 2 input scan lines to the output multi-level data of the "n" x "n" matrix corresponding to "n" pixels in the main scan directions and "n" output scan lines.

37. The image resolution conversion circuit as claimed in claim 35, wherein

said data transform unit divides the "n" x "n" matrix with the middle pixel array and the middle scan line into four "(n-1)/2" x "(n-1)/2" sub-matrixes, and

determines the output multi-level data of the four "(n-1)/2" x "(n-1)/2" sub-matrixes based on the corresponding respective input binary data;

the output multi-level data of the upper "(n-1)/2" items and the output multi-level data of the lower "(n-1)/2" items in the middle pixel array

are based on 2 upper items and 2 lower items, respectively, in the 2x2 matrix;

the output multi-level data of the left "(n-1)/2" items and the output multi-level data of the right "(n-1)/2" items in the middle scan line are based on 2 left items and 2 right items, respectively, in the 2x2 matrix; and

the output multi-level data of the cross point of the middle pixel array and the middle scan line are based on 4 items in the 2x2 matrix.

38. The image resolution conversion circuit as claimed in claim 37,

wherein the data transform unit, when determining the output multi-level data of the middle pixel array based on the 2x2 matrix, shifts the phase of the output multi-level data so that a pulse of the light beam is shifted in the main scan directions toward a pixel that is turned on.